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BULLETIN
OF THE ROYAL ONTARIO MUSEUM OF ARCHAEOLOGY

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UNIVERSITY OF TORONTO · MAY 1955 · NO. 23

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SIX BRONZE VESSELS FROM CHINA

Thanks to the generosity of the Reuben Wells Leonard Bequest, the Royal Ontario Museum of Archaeology has recently acquired six ancient Chinese bronze vessels of the highest quality. They were excavated about thirty years ago from tombs of early Chinese kings and nobles, not in a group, but at various places. No one knows the exact sites, for archaeological work was not organized in China at that time, and trained scientific excavation was only just beginning. These vessels were probably discovered in fields where a depression after a rain suggested to the owner there might be a grave below. Farmers and villagers would gather to dig out what they could find and divide the spoils, which would in most cases be sold to local antiquarians for what they would bring. These particular bronzes doubtless commanded a high price, for not only were they very ancient but they were complete and, best of all, five out of the six bore inscriptions (which, like nearly all early vessels, had only one, two, or at most five or six pictographs). Anything with written characters on it has always been doubly prized by the Chinese.

These vessels are of the earliest historical periods: the Shang Dynasty, *c.* 1300–1100 B.C., and the beginning of Chou, *c.* 1100–950 B.C. They were used in the worship of ancestors. It is evident that only the king, his priests, and a few nobles would at that time have such treasures, for writing had but shortly before been invented and only the few initiated who could read and write and keep records would know who their ancestors were! Moreover, bronze was more valuable then than gold and few could afford vessels of it. We know that such vessels were handed down in a family as most highly prized heirlooms—the inscriptions make that clear—but why, then, were they ever buried with a member of the family? That is a mystery as yet unsolved. When a high official died he presumably went to *join* his ancestors—why then would he take with him the vessels that had been made for the use of the living in worshipping them and now himself! No one knows, and so far no ancient text has thrown light on this apparently illogical practice.

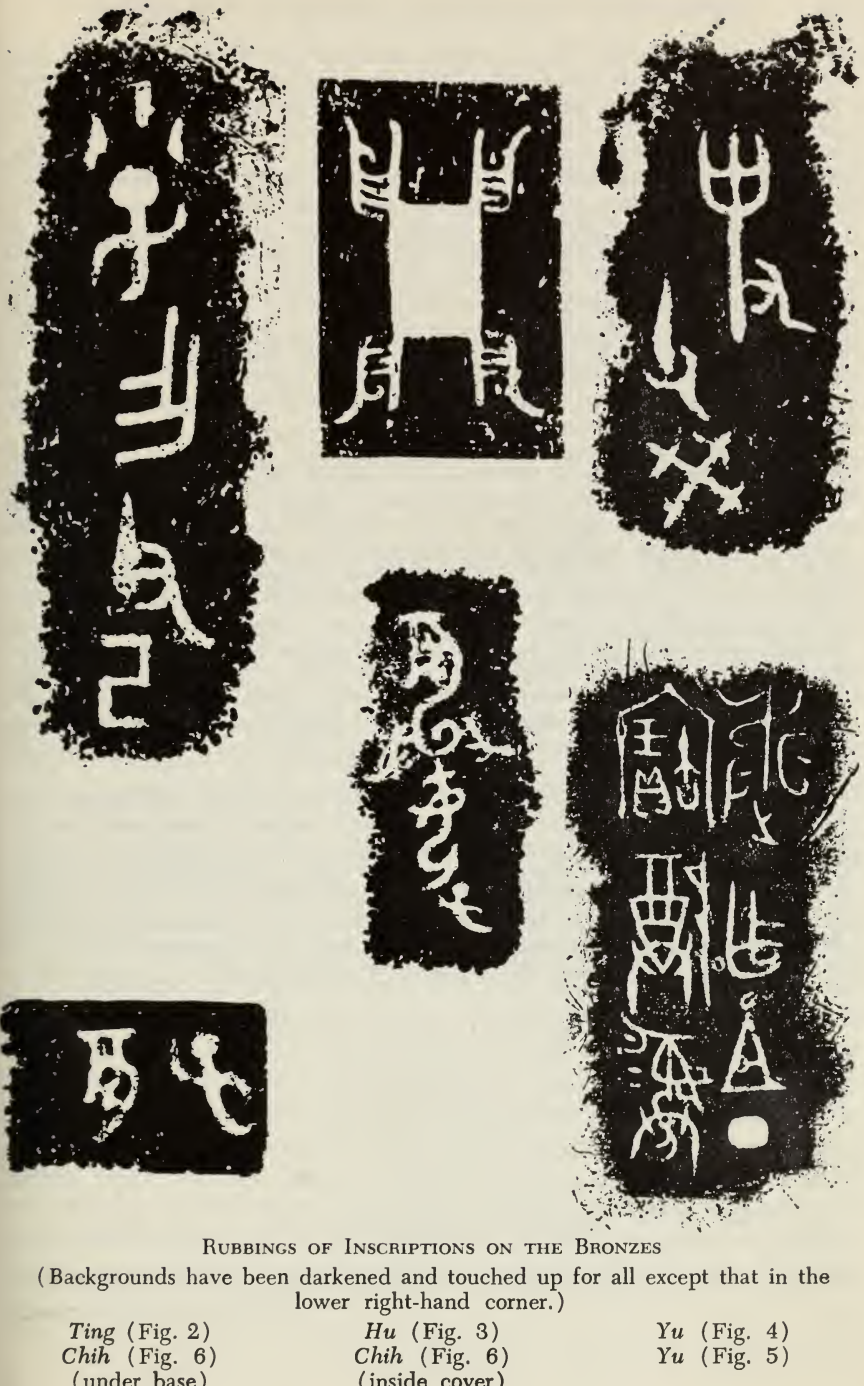
The six vessels which have come to Toronto, to be among the leading art treasures of the Museum, are some of the most beautiful ever found. It is bronzes such as these that constitute the most highly prized art objects of that early period, in the dawn of Chinese civilization. The shapes are strong, sturdy, and dignified and the proportions beautiful. The vessels are probably even more beautiful now than when they were new, for centuries of burial in the earth have given them a soft green patina, which has, in nearly every one of them, been brought to a satiny finish by the polishing hand of a loving owner since their discovery. Differences in colour are due to the chemical action of the earth upon the bronze, which varies according to the site, and to the alloys which may occur in the bronze. For instance, the two *yu* pails, with swing handles, are said to have been found at Ch'ang-sha, on the basis of their exquisite pale light-green water patina which was characteristic of the bronze articles found in the most ancient tombs at that place. But these are 3,000 years old, approximately, earlier than the known tombs at Ch'ang-sha, so it is more likely that they came from an older site, probably that of the Shang II capital near An-yang, North Honan. Their decoration consists entirely of animal motifs, very highly stylized, and of other religious symbolic motifs.

Finally, look at each individual bronze! The technical excellence and skill in casting could hardly be equalled today. Both the lost wax process (*cire perdue*) and the use of piece moulds were known and used. The decoration, and the sunken inscriptions, were cast with the bronze, not cut out or engraved afterwards. In many cases the lines of the decoration are deep and are inlaid with a black pigment the nature of which is still unknown. Such inlay can be seen on the three-legged cauldron, a shape called *ting*, and the tall wine container, *hu*. Other notes of interest may be found in the individual descriptions of the vessels, below.

Fig. 1. A *tsun* or wine container of monumental quality; probably very early (before 1350 B.C.?). It has a beautiful deep leaf-green patina. The design is in deeply sunken outlines in two bold bands, around body and on shoulder. Animals in the bands meet at three ridges to form a sort of monster mask with bulging eyes, heavy arched horns, and curved lip and nostrils. Such a creature was (in later times) called a *t'ao-t'ieh* (literally "glutton monster"). The roughly cruciform holes in the side of the high base are characteristic of many of the earliest bronzes. This bronze has no inscription. Height, 12 in. Shang.

Fig. 2. A *ting* or three legged cauldron used probably for heating spiced minced-meat. The majority of the earliest vessels used in ancestral rites were for wine, but the *ting* for cooking meat was very important. This is a magnificent example with its early variety of the interlocked T design and its border of hooked-beak birds. There are *t'ao-t'ieh* motifs on the legs. The inscription, on the inside just under the rim, says it is dedicated to Father Chih (who was one of the Shang kings). Height 12 in. Shang.

Fig. 3. A *hu* or storage jar for wine, with vertical lugs at the sides to take a rope handle. All over it are dragon shapes forming *t'ao-t'ieh* masks where the heads come together, and the horns of the largest *t'ao-t'iehs* have animal heads with long trunks, like elephants, and the base shows great beaked birds looking



Rubbings of Inscriptions on the Bronzes

(Backgrounds have been darkened and touched up for all except that in the lower right-hand corner.)

Ting (Fig. 2) *Hu* (Fig. 3) *Yu* (Fig. 4)
Chih (Fig. 6) *Chih* (Fig. 6) *Yu* (Fig. 5)
(under base) (inside cover)

back over their shoulders. Such creatures cannot be identified—they seem to have been just symbolic of various forces of nature. All over the background behind these animal motifs is a fine network of spirals called *lei-wen*, meaning "thunder pattern." It was a call for rain—to make the crops grow. This was the chief prayer of the living addressing the spirits of their ancestors. This vessel has a very early pictograph which represents a stretcher being carried by four hands. It was probably a family name or emblem, something like a crest. H. 15½ in. Shang.

FIG. 4. A *yu* or pail with swing handle. It is plain except for three bands of scroll ornament. Those around neck and cover are known as "triple animal bands." The one around the base is a "diagonal *tei-wen*" band. The bright eyes, with the hooked inner corner, have pupils in relief, but the rest of the décor is flat. Animal heads with spiral horns ornament the handle where it swings on the rings at the sides of the vessel. The patina of this vessel, light green and lively green, is superb. The inscription consists of the family crest, a picture of a hand holding a pen, and the dedication to "Father Kuei," again one of the Shang kings. H. 15 in. Shang.

FIG. 5. This is of exceptional beauty in the colour of its patina. It is another *yu* or pail with swing handle, a vessel used for spiced wine and made with a snug-fitting cover so as to retain the fragrance of the drink. The dragons of the narrow bands are thin and in high relief against a background of fine *lei-wen* and the animal heads on the handle are of big-horned sheep. But it is the plain surface which is so lovely in its satiny pale-green polish and unctuous texture, while the squat shape is well proportioned and the curves almost sensual in quality. This is the latest of the six bronzes. It belongs to the beginning of the Chou period, probably about 950 B.C., and has the longer inscription which was also characteristic of Chou. It reads "So-and-so (an unidentified name) made for ancestor *Ting* [this] precious ritual vessel." This vessel is also said to have come from Ch'ang-sha, but again the only evidence is its wonderful colour, and its style is still too early for what we at present know about Ch'ang-sha. It is a most precious piece. H. 10 in. Early Chou.

FIG. 6. This is a much smaller bronze. It is a *chih* or drinking cup with a cover. Most *chih* are oval in section but this one is slightly squared. There is no "thunder pattern" background here but a more plastic décor, with the features of the *t'ao-t'ieh* detached from each other and raised in relief. The inscription inside the cover shows a dragon being held up by two hands, followed by an early character for "mother" and then the one for child or prince, reading something like "The Kung-family mother of the prince." There are two characters under the base of the vessel, reading *tzu Kung* "Prince Kung." H. 6 in. Late Shang or early Chou.

HELEN E. FERNALD

A TORSO OF VENUS

An important addition to the Museum's collection of Greek and Roman sculpture is a torso of Venus recently presented by Mrs. Frank H. Shelley in memory of her husband. The torso was purchased in Berlin in 1932 at an auction of the collection of Wilhelm von Bode, once director of the Altes Museum and owner of a fine collection of majolica, in the study of which he was a recognized authority. This sculpture seems to have been the only ancient piece in von Bode's collection, and is reported to have been found in excavations in Italy.[1]

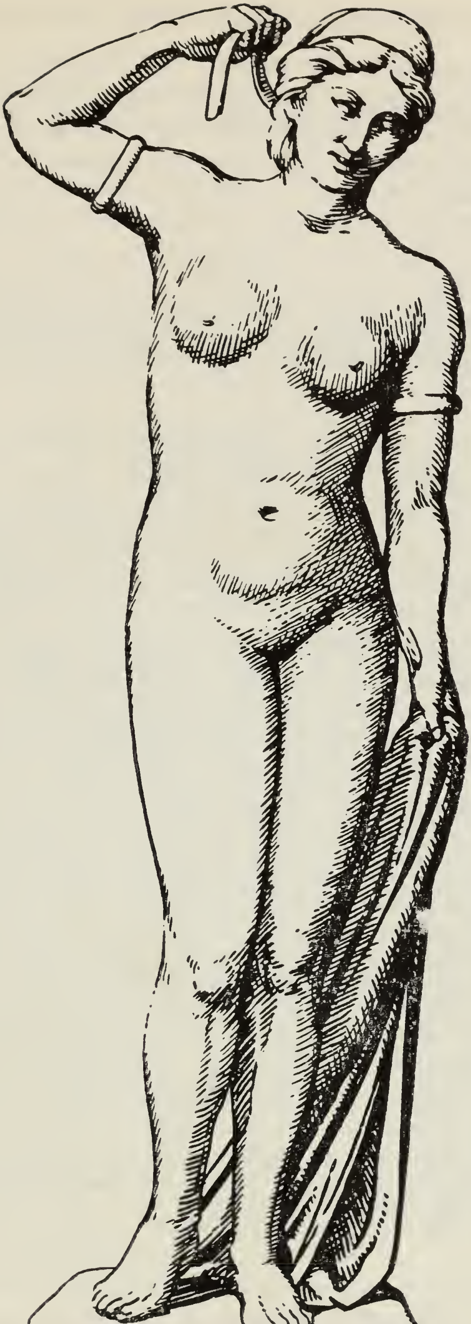
The statue, of approximately life size, is made of a grayish-white marble containing strata of darker colour which give to the torso, especially in a photograph, something of the appearance of wood (Fig. 7). However, Dr. V. B. Meen of the Royal Ontario Museum of Geology and Mineralogy, has been kind enough to examine the stone, and it is his opinion that in the original completed appearance of the statue the darker strata would have been far less conspicuous, as indeed is still true of the rear view of the torso (Fig. 9). The front has evidently been exposed to prolonged weathering over a very extended period of time according to Dr. Meen, which has resulted in a lowering of the lighter and softer parts of the stone, while the darker and more resistant bands have thus been left projecting a millimetre or so above the general surface.

Remarkably similar in superficial appearance is a torso carved in 1938 by Bernard Reder from a French limestone, which now stands in the garden-court of the Museum of Modern Art in New York (Fig. 8). Reder has done a good deal of sculpture in wood, and presumably was influenced by this in his selection of a material which creates an interesting pattern of contour lines. Actually the effect, although as we have seen no doubt unintentional, is more striking in the Toronto torso, as for example in the breasts which are carved in a white marble stratum with the darker strata outlining their circumference with a swirling pattern. The dark strata in the modern torso are evidently much more intense since it is colour alone, and not differential weathering, which lends them their prominence. The proportions of the modern figure are also very unlike those of the ancient,[2] and there seems to be no good reason, indeed, to suspect that the Toronto piece is anything but ancient.[3]

The Toronto torso obviously belongs to a large group of nude standing figures of Aphrodite which bear a general family resemblance to one another but which exhibit considerable variations in details of pose. The position of the body and legs resembles, in reverse, that of the well-known Aphrodite from Cyrene, though the shoulders are more steeply angled and the raised right arm (in the Cyrene, the left) is held much higher. Even so it might be possible to consider our torso as also belonging to the "Anadyomene" type, in which Aphrodite, emerging from the sea at her birth, bends both arms at the elbows and presses the water from her tresses. But against this is the fact that low down on the left hip there is a hole for a pin to attach the arm and a rough area for a couple of inches above and below this point, suggesting that the arm was in contact with the stone for about four inches. If bent at the elbow and elevated away from the body, the upper part of the left arm could not have been long enough to account for these traces; indeed they surely indicate that the forearm continued in approximately the same direction as the upper arm, following the line of the left thigh.

Remains of a support against the left leg find an analogy again in the Cyrene Venus, where the support takes the form of a garment draped over a post against which is carved a dolphin. It is conceivable that a similar treatment was employed in the Royal Ontario Museum figure, but the line of the left shoulder indicates that she was not leaning any weight on a support, but was perhaps merely holding or dropping her garment. Indeed the oblique cutting on the rear half of the left thigh, as seen in Figure 9, seems by the resemblance of its tooling to that on the arm-stump surfaces to be definitely ancient, and suggests that a separate piece of drapery, whose overlapping upper edge would have concealed this oblique cutting, passed behind the body in the direction of the right heel, as shown in the restoration (line drawing opposite). The right arm seems to have been raised sharply toward the head, possibly undoing a ribbon wound about the hair. The slight turn of the head to the left is suggested by the barely noticeable protrusion of the muscles on the left side of the neck where the stump is preserved, and the general form of the head is adopted from the similarly posed torso, with head preserved, once in the Spink galleries and illustrated in Reinach, *Répertoire de la statuaire grecque et romaine*, III, 106. 3.[4]

The proportions of the figure are rather more generous than those of the Aphrodite of Cyrene, but definitely lighter than the tradition of the Aphrodite of Melos (Venus di Milo). The modelling of the figure,



Suggested Restoration of the Venus, drawn by Sylvia Hahn while not outstanding for its subtlety and delicacy, is nevertheless competently and pleasingly executed. The torso is thus a good example of a late Hellenistic or early Roman copy of one of the numerous variations on the nude Aphrodite theme so popular in the later Greek and Roman times.

J. W. GRAHAM

NOTES

1. It is mentioned in the catalogue of the auction, Robert Schmidt, *Nachlass Wilhelm von Bode 1929, Auktionsleitung Paul Cassirer und Hugo Helbing*, p. 35, No. 76, "Venustorso. Marmor. Der Kopf, die Beine und die Arme fehlen. Der Ansatz der Arme erhalten. Römisch nach hellenistischem Vorbild. Höhe 90 cm."
2. The modern torso has, of course, no attachments for head or limbs, and the arm and neck stumps are only roughly finished.
3. Additional technical details: Height of figure as preserved, one metre; width at waist 27 cm. Holes in the centre of the right arm-stump (10 cm. deep, 3 cm. diam.) and at the base of the neck (5 cm. deep to the lead plugging, 5½ cm. diam.) were intended for pins to secure the arm and head. The leaded iron pin is still partially preserved in the neck-hole. The head and arms were further secured by leaded iron clamps, placed on the top surface of the right arm, the outside surface of the left arm, and at the nape of the neck; the preserved portions indicate a clamp of about 8 to 10 cm. long. Perhaps the joints at the middle of the upper arms were concealed by metal armlets, as in the left arm of copies of the Aphrodite of Knidos. The anterior portion of the left arm-stump has been trimmed off obliquely, evidently in modern times, since the tooling differs from that on the posterior portion. About 6 cm. below the left armpit another deep hole (12 cm. deep, 2½ cm. diam.) extends horizontally into the body; no doubt this hole for an attachment-pin is a substitute for an attachment-hole in the end of the arm-stump as found on the right arm. Some 20 cm. below this hole a smaller one (3 cm. deep, 1 cm. diam.) runs obliquely downward in the middle of an area of rough tooling about 12 cm. long by 6 cm. wide (horizontally). Some 15 cm. lower than these traces on the left hip appears the beginning of a rough protruding area which clearly formed part of a support for the left leg. Near the upper edge of this protruding area, at a point about 10 cm. below the pelvis, the iron pin, visible in the photo, is probably a modern addition, for the hole in which the pin is set looks fresher and more roughly cut than the ancient holes elsewhere on the statue, and is plugged merely with plaster; perhaps the pin was intended for attaching the statue to some lateral support. The right leg has been trimmed off above the knee, no doubt when the torso was exhibited in modern times.
4. My thanks are due to Miss Sylvia Hahn, artist on the staff of the Royal Ontario Museum of Archaeology, for her sketch, and for her helpful advice in regard to possible restorations of the missing limbs.

PAUL KANE, PAINTER OF INDIANS

One of the most popular exhibits in the Royal Ontario Museum of Archaeology is the collection of oil paintings and watercolour sketches by Paul Kane. Letters, telephone calls, and requests for information and photographs of these loom so large in the daily business of the curator that one is impelled to ask why this should be so. While there are likely to be many reasons, the following thoughts suggest themselves.

Kane, who evidently was born in Toronto in 1810, was as much a product of the Upper Canada of his time as one could well be. His father, Michael Kane, a military man by profession, could give the boy few advantages, but did succeed in sending him for a while to a grammar school in Toronto, where he came under the influence of an art teacher by the name of Drury. Information on Kane's early life is scant, yet we know that he worked for some time, doubtless as an apprentice, with a cabinet-maker in Toronto, and during this employment he must in the nature of things have learned something about the rules of a craft. He then began to paint portraits of the local gentry, or of such as could afford them, and he seems to have made sufficient money in that way to be able to depend upon it for a livelihood. It was not very remunerative, as one might expect, and the young man had visions of more important work.

At some point along the way, Kane began to formulate ideas concerning his lifework. They were much too grandiose for his training to support, and it was this thought which doubtless led him further afield to advance his ambition. At any rate, he left Toronto and his little practice for greener pastures. He went first to the United States, and by easy stages seems to have made his way as far as New Orleans, travelling along the Mississippi route. There can be little doubt that the young man executed portraits while travelling as opportunity afforded. There is equally little doubt that this adventure through the "western frontier," as it then was, proved an intellectually stimulating experience, for it must have opened Kane's eyes to the new world which was just then being revealed to Americans, and to have shown him the wonder and the excitement of it all.

Kane sailed from New Orleans for Europe in 1841, intending, as he says, "to improve his talents" for painting. Although he sojourned in Italy, France, and England for nearly four years, with side trips into

North Africa and Asia Minor, it is not clear precisely what serious work he did. It is extremely unlikely that he had the necessary money for a student's fees with a master; it is more probable that he visited the great galleries of Florence, Paris, and London, talked there with students like himself and with the artists, and as we should say, "absorbed the atmosphere"; all of which must have broadened his outlook immeasurably, sharpened his perception, and spurred him to improve his work. In the process, he fell strongly under the influence of Delacroix and the Romanticists.

When Kane returned at last to Canada, he was no longer a young man, but he had learned much. This is obvious to anyone who has been able to compare one of his early portraits with work done after his return from Europe. The old ideas which had, we surmise, impelled him to seek to improve his "talents" now returned in full force. He was sure at last what his life work was to be. He wanted to perform something which had not been done before, so far as he knew, and which above all would be a service to his homeland of Upper Canada. To use his own words,

> I determined to devote whatever talents and proficiency I possessed to the painting of a series of pictures illustrative of the North American Indians and scenery. The subject was one in which I felt a deep interest in my boyhood. I had been accustomed to see hundreds of Indians about my native village, then Little York, muddy and dirty, just struggling into existence, now the City of Toronto, bursting forth in all its energy and commercial strength. But the face of the red man is now no longer seen. All traces of his footsteps are fast being obliterated from his once favourite haunts, and those who would see the aborigines of this country in their original state, or seek to study their native manners and customs, must travel far through the pathless forest to find them. . . . The principal object in my undertaking was to sketch pictures of the principal chiefs, and their original costumes, to illustrate their manners and customs, and to represent the scenery of an almost unknown country. These paintings, however, would necessarily require explanations and notes, and I accordingly kept a diary of my journey. . . . The following pages [in the *Wanderings of an Artist*] are the notes of my daily journey, with little alteration from the original wording. . . .

Kane had known the Indians from boyhood, as he says, having watched them fish by torchlight on Toronto Bay; he appreciated their achievements, could foresee their fate, and wished to record them and their ways for all time.

Now in his middle thirties, Kane was prepared to embark on the great project, beginning it with a preliminary short excursion, which took him as far as Wisconsin. In the course of this trip he made numerous sketches of the Ojibwa Indians around Owen Sound, of the Menominee on Green Bay, Wisconsin, as well as of other natives met between these points. This was in 1845. The next year, confident of his abilities to rough it, he set out on the crowning adventure of his lifetime—a two-year junket to the Pacific coast and back. Admittedly, a good many individuals had made the trip before him, and some of them had suffered death as the result. But it is doubtful if any of these men endured greater hardships or left more interesting information behind them as a result of their journeys. On the long trip, Kane travelled essentially singly, although he availed himself, as everyone who could did in those days, of the aid of the Hudson's Bay Company. He took with him only the barest essentials for his painting and for existence.

Kane brought back with him five hundred or more sketches of the places he had seen and the Indian camps he had visited, together with a large number of portraits, and sketches of ethnological specimens, animals, trees, and other "curiosities." Add to this the items sketched on the trip to Green Bay, and Kane is seen to have had a very considerable repertoire upon which to draw for the studio work to which he looked forward. Slightly more than three hundred of the field sketches were presented to the Museum by Major Raymond Willis, a descendant of Hon. George W. Allan, Kane's patron and staunch friend; these are available for study. Another group is still in private hands. All the sketches are characterized by a freshness and vitality which immediately attract one; if we can imagine the arduous circumstances under which the artist must have worked at them—in a moving canoe, in the excitement of a buffalo hunt, or in the intense cold, or again, under the suspicious eyes of hostile Indians—we must concede his ability to capture not only delightful bits of scenery but the siginficance of the action or the view before him as well. Because of somewhat faint colouring they frequently do not reproduce well, but the accompanying photographs may give some idea of their general quality (Figs. 10–13).

Having returned to his native city, and now in his thirty-seventh year, Kane married and settled down to concentrate upon working his material into final form. Precisely what he had in mind we do not know, other than that he hoped to find a patron, or patrons, who would enable him to paint a series of oils from the sketches he had made, thus translating to a more permanent form the impressions he had noted in the sketch book or on loose sheets of paper. It was a rather visionary, if laudable, scheme. Patrons were not easy to find. The Legislature of Upper Canada awarded him a contract which was much smaller than he anticipated. The situation might have had disastrous results had it not been for the interest and generosity of a public-spirited citizen in the person of the Hon. George W. Allan, mentioned above, who gave Kane an order for one hundred oil paintings. In due course these were finished and delivered to Mr. Allan, and in the fullness of time were donated to the Museum through the kindness of the late Sir Edmund Osler. During the past thirty years, they have become widely known throughout Canada and the United States, and are in great demand as illustrative material by writers and research students.

When all the orders for oil paintings were filled, Kane found himself free to concentrate upon his book of travels, which appeared in 1857 as *The Wanderings of an Artist*. There is no doubt that this work has done a great deal to popularize Kane, both in his own day and at the present time, and to draw attention to his artwork. That is not to claim for it any special merit as a literary production; its chief claim to a place in the sun rests on the convincing, if pedestrian, narration of the arduous journey, and of interesting anecdotes and ethnological facts picked up along the way. Fortunately, Kane kept a descriptive record of the sketches as he made them, the manuscript of which is still in private possession, and which the author says he used in writing the book. That the manuscript is still extant is important in itself, for it may contain much that was not considered interesting enough to include in *The Wanderings* but which would be considered important today. Kane's other published writings are inconsequential, consisting of brief articles for the press on some topic handled more satisfactorily in the book.

He also brought back a collection of "curios," consisting largely of Indian costumes, drums, baskets, and similar products, which in the course of time was presented by Hon. George A. Allan's descendants to the Royal Ontario Museum of Archaeology and to the Winnipeg Museum; they are now on display in both these museums. Considered as a whole, these two segments represent one of the most important collections ever brought back from the old West and still preserved in Canada, and as such are invaluable to the student of ethnology.

Despite his intense interest in things Indian, and his determination to paint them, even at heroic cost, Kane seems not to have been aware of others who had done, or were doing, similar work. Many years before him, Meares had sketched Indians of the Northwest Coast for Captain Vancouver; during Kane's youth, the young Swiss immigrant Peter Rindisbacher, untrained like himself, was doing superb illustrations of the natives of Hudson Bay and the Red River country; and that American adventurer of many parts, George

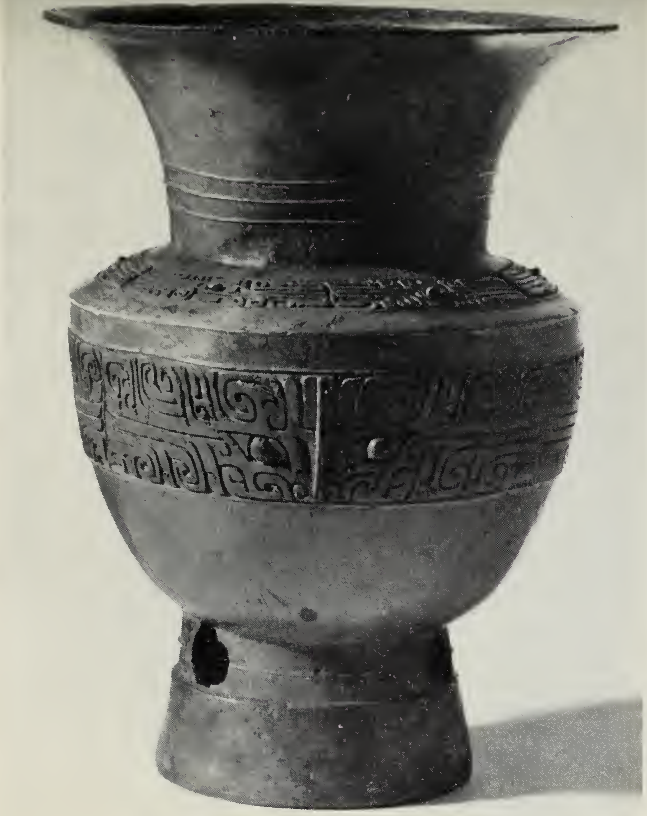


FIG. 1. Bronze ritual vessel, *tsun*. Chinese, early Shang Dynasty.
H. 12 in.

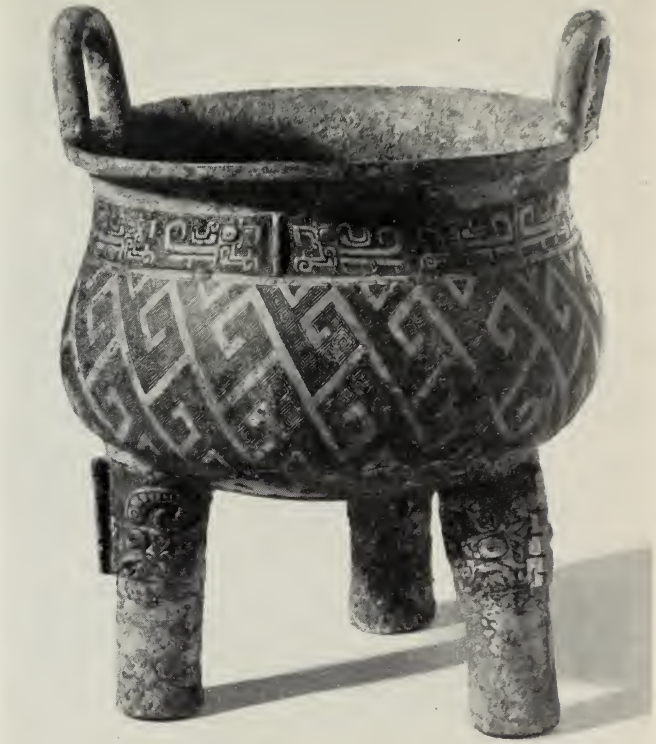


FIG. 2. Bronze ritual vessel, *ting*. Chinese, Shang Dynasty.
H. 12 in.

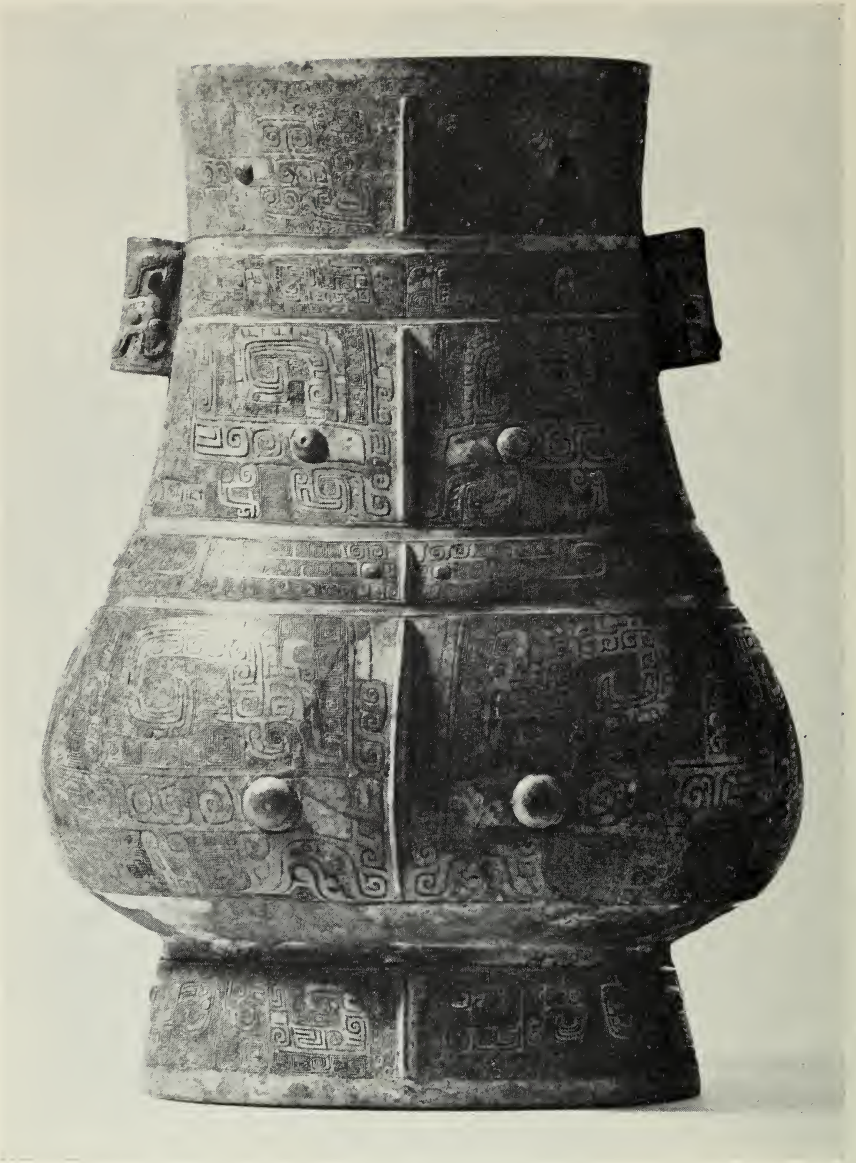


FIG. 3. Bronze ritual vessel, *hu*. Chinese, Shang Dynasty. H. 15½ in.

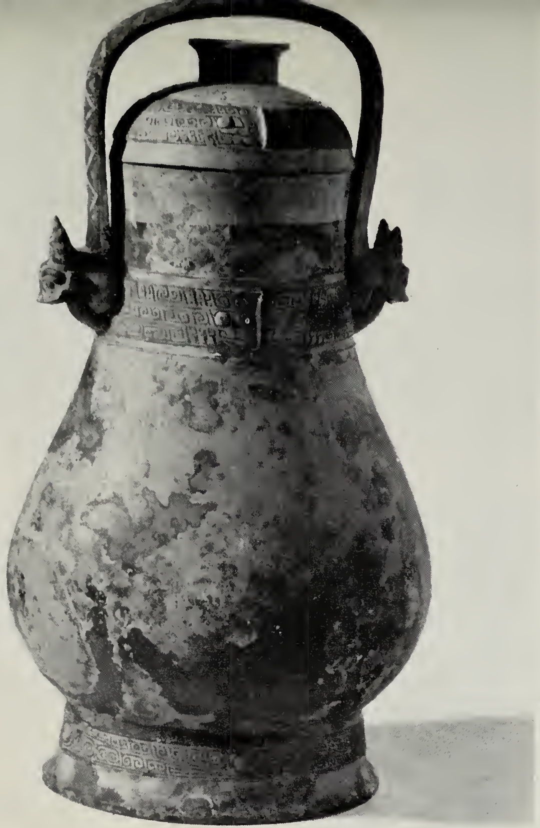


Fig. 4. Bronze ritual vessel, *yu*. Chinese, Shang Dynasty. H. 15 in.

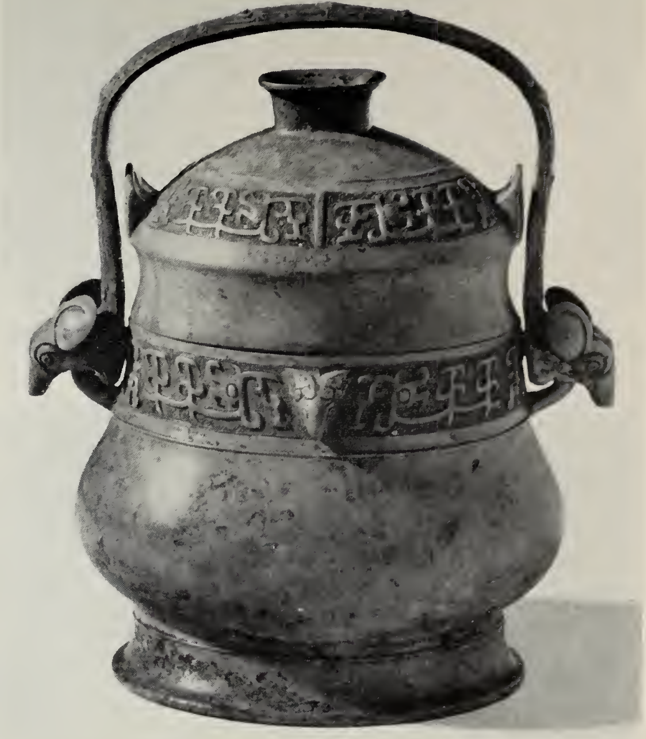
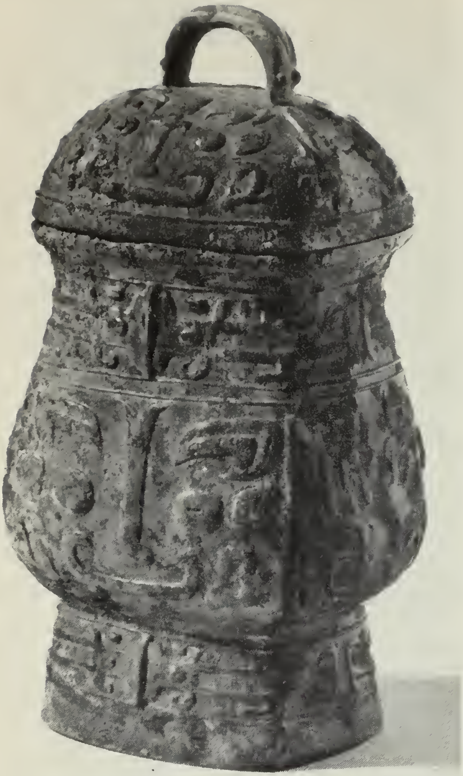


Fig. 5. Bronze ritual vessel, *yu*. Chinese. early Chou Dynasty. H. 10 in.

Fig. 6. Bronze ritual vessel, *chih*. Chinese, la
Shang or early Chou Dynasty. H. 6 in.



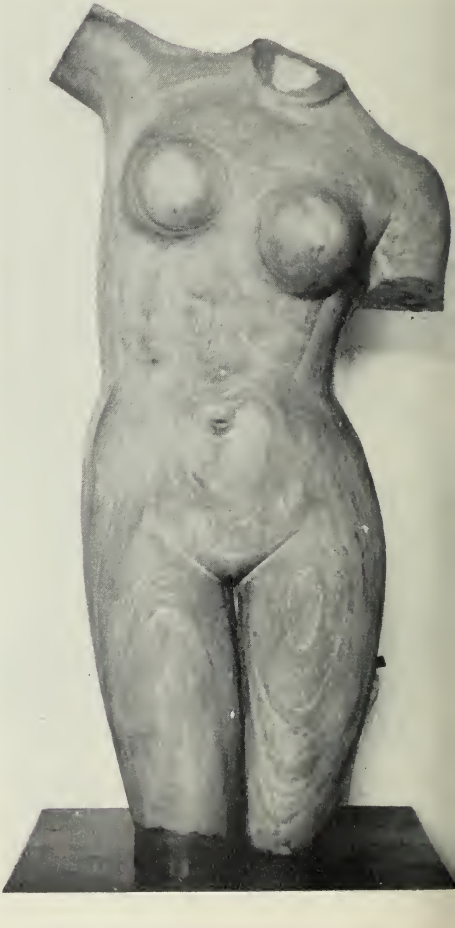
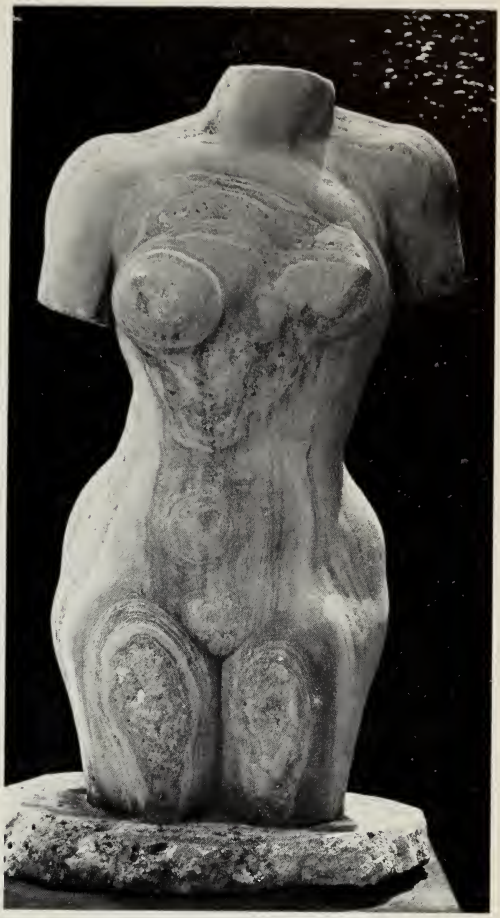


Fig. 7. Marble torso of Venus. Late Hellenistic or early Roman period. Approximately life-size. Front view.

Fig. 8. Limestone torso, by Bernard Reder. Contemporary. Museum of Modern Art, New York.



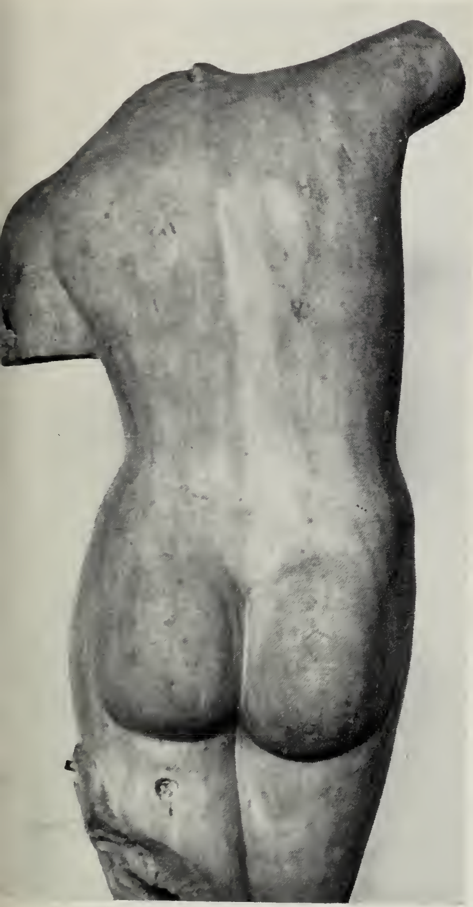


Fig. 9. Rear view of the marble torso of Venus.

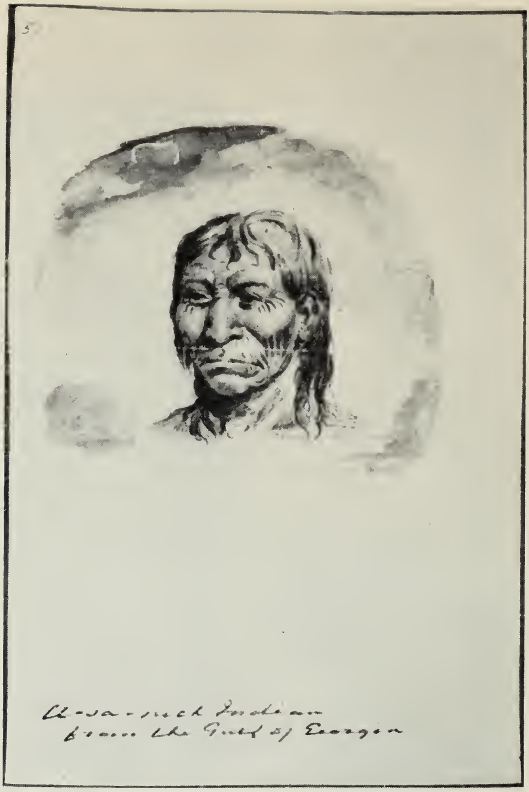

A-ja-nick Indian
from the Gulf of Georgia

FIG. 10. *A-ja-nick Indian from the Gulf of Georgia.* Sketch in pencil and watercolour by Paul Kane. Dimensions: 5 x 7 in.

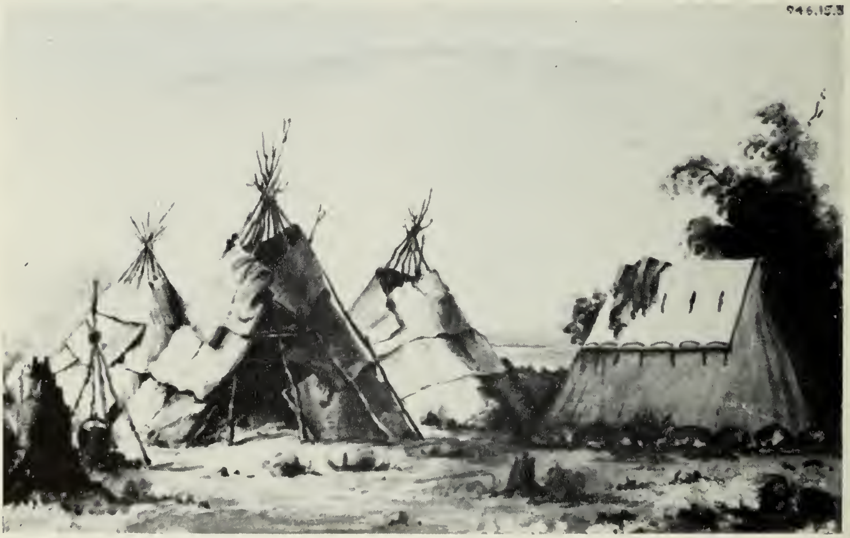


FIG. 11. *An Indian Camp on Lake Huron.* Sketch in pencil and watercolour by Paul Kane. Dimensions: 8½ x 5½ in.

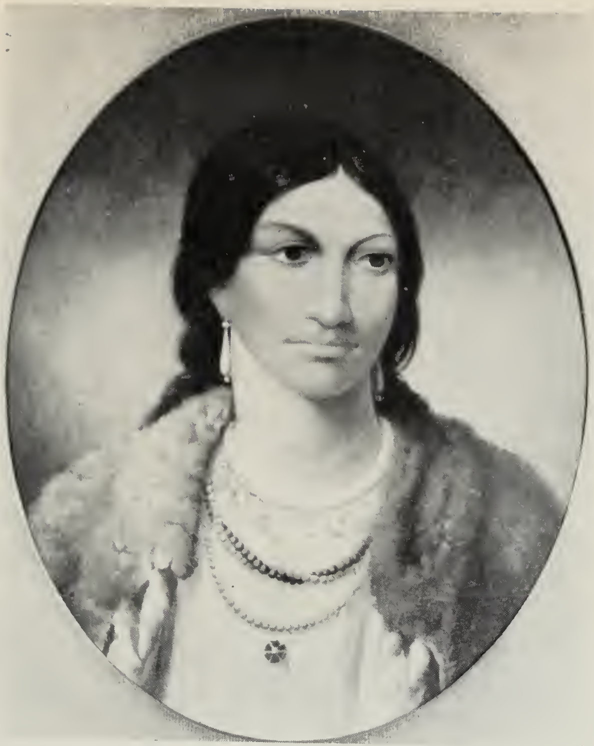


Fig. 12. *The Daughter of Asa-bon-ish.* Oil painting by Paul Kane. Dimensions of oval: 24 x 20 in.

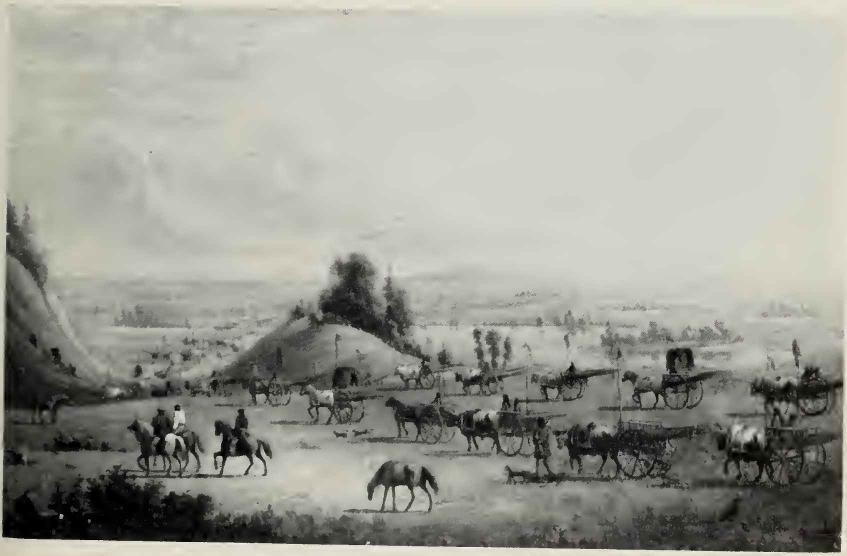


Fig. 13. *Half-breeds Travelling.* Oil painting by Paul Kane. Dimensions: 18 x 29 in.

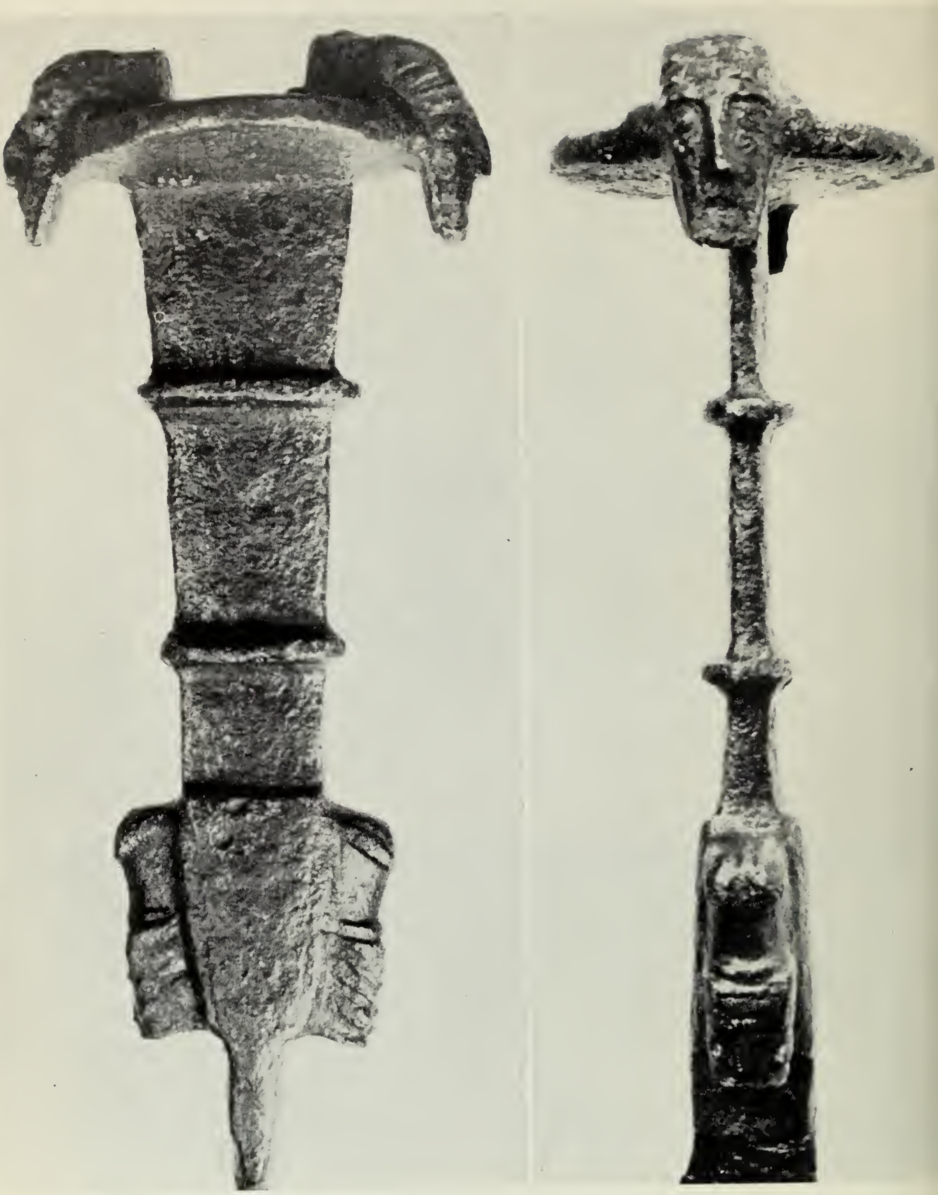


Fig. 14. Iron dagger from Luristan. Probably 9th or 8th century B.C. Length 15¾ in.

Catlin (1796–1872), had been painting the prairie people since the middle thirties. Likewise in the 1830's, Charles Bodmer did extraordinarily fine studies of the Plains Indians for Maximilian, Prince of Wied-Nieuwied. Yet there is no suggestion in any of Kane's literary or artistic remains to indicate that he knew of these antecedents. Nor does he seem to have noticed his contemporaries: the German-American Gustavus Sohon (1826–1903) who sketched the natives of Washington Territory about 1856; Charles Wimar (1828–1862) who worked in the Upper Missouri region; or his fellow countryman, Cornelius Krieghoff (1812–1872). The only link with a fellow artist that is so far proven is that with the much younger Frederick Verner (1836–1928), who painted Kane's portrait. The isolation from which Kane suffered may have been ultimately to his advantage, for it resulted in his work being peculiarly his own. We can be reasonably sure that, except for the general influence of the Romanticists, Kane's work is in a sense that of a "primitive," reflecting accurately the attitude of an Upper Canadian of his time with regard to the Indians and Indian life.

Just as Kane foresaw, the time has come less than a century after his death (1871) when the old life has passed away for the Indians, and in many instances their place knows them no more. He was thus a prophet—a practical one who took measures to preserve what he perceived was about to disappear. For that service present day Canadians are certainly grateful. Kane has made the visualization of the Indian scene immeasurably clearer and more factual than it could have been for us otherwise.

All of these factors have undoubtedly contributed to Kane's popularity today, and help to occasion the many inquiries concerning him; they mark him as one of early Canada's most public-spirited citizens, a man of vision and a man of sincerity. His contribution to ethnology has been important; as a traveller he left a book which appeals strongly to the imagination; and he will always remain the earliest Canadian artist in point of quality and quantity of production.

KENNETH E. KIDD

NOTE

The accompanying illustrations are representative of both Kane's field sketches and his studio work. The sketch of the *A-ja-nick* (Fig. 10) contrasts strikingly with the oil portrait of *Asa-bon-ish's Daughter* (Fig. 12), the one being revealed in broad outline and the other in careful detail. Similarly, the oil painting of *Half-breeds Travelling* (Fig. 13) shows the finished character of the studio work in contrast to the free, almost impressionistic characterization of *An Indian Camp on the Shores of Lake Huron* (Fig. 11), done in pencil and watercolour.

AN IRON DAGGER FROM LURISTAN

While the world plunges into the Atomic Age, iron maintains its supreme position among the raw materials essential to civilized man. No fugitive from industrialized society, however well-suited he might be to a primitive life, could live and work independently of iron, for without its benefit he could scarcely obtain the tools, the raw materials, or even the food necessary to his survival. The discovery of iron-working, then, is one of the greatest landmarks in mankind's eventful journey from the Old Stone Age to the industrialization of to-day, and the iron dagger reproduced in Figure 14, a remarkable example of early iron-work, should be of interest to everyone who is curious about the origins of civilization.

This dagger, along with the other known specimens of its type, presents many unsolved problems. It cannot be accurately dated; we do not know definitely where it was made; and the technical methods used in its production are incompletely understood. Nevertheless, it certainly belongs to the broad period when iron weapons and tools were gradually coming into general use for the first time in human history, and it ranks among the oldest iron objects of such elaborate form in existence anywhere in the world.

The hilt terminates in a disk-shaped pommel which is ornamented with two human heads fashioned in the round. These heads face outward at opposite sides, hanging masque-like over the edge of the disk. They have a long, hooked nose, bulging eyes, and short, square beard. Back to back with them are lion's heads with roughly square muzzle, which form the sides of a groove across the centre of the disk; headdress and lion's mane merge together so that the rows of tufts decorating the intervening surface can be regarded as belonging either to man or to beast. These ornamental elements are so complex in form that it is difficult to imagine them being shaped without the aid of a mould or die of some sort. The grip of the weapon is a flattened oval in cross-section. It contracts in width and expands in thickness toward the blade and is encircled by two unequally spaced rings. Near its juncture with the blade the hilt is guarded by two crouching lions, fashioned apparently in the same technique as the heads on the pommel. They lie on each edge facing the tip of the dagger. The human heads and the lions conform to the main axis of the hilt but the blade is turned at right-angles to it. Blade and hilt are wrought from a single piece of metal. The dagger is virtually complete, but all surfaces have suffered badly from oxidization, so that some of the detail in the decoration has been lost. The blade seems to be approximately its original length; it had a straight narrow outline and plain surfaces with little or no faceting. The length of the hilt is 6½ inches (16.5 cm.) from the top of the heads on the pommel to the actual juncture with the blade one-half inch below the lions. The total length of the object is 15¾ inches (39.5 cm.). The dagger, which was purchased by the Museum in 1931 at a sale of Sotheby and Company in London, was formerly in the possession of a well-known dealer in Teheran. His statement that it came from Luristan, western Iran, is confirmed by study of the object.

In West Asia during the first half of the first millennium B.C. thrusting weapons of short to medium length were much more common than slashing swords, which at that time were a comparatively recent innovation. On account of its length our dagger might equally well be called a short sword, but it was evidently designed for thrusting. Its narrow straight-sided blade, sharp point, and peculiar hilt would be less effective for slashing than for stabbing blows, which would not require so strong or flexible a metal. Among the known specimens of its type, with the same unvarying hilt, the blades differ considerably from each other in length and in outline, and must have been wrought according to different specifications. In every case, however, the hilt is set at right-angles, as in ours. This feature is without parallel among swords and daggers and at first glance seems to be functionally awkward. It is more easily understood when one assumes that the grip was well covered in its own day with a perishable material. The two rings were probably intended to hold in place a leather binding, or perhaps a padding of wool or hair under such a binding. The grip would by this means be rounded out comfortably for an effective blow.

Our dagger is not by any means unique. There are similar specimens in many museums, including the Teheran Museum, the Louvre Museum, the Musée du Cinquantenaire, Brussels, the British Museum, the Oriental Institute of the University of Chicago, and the University Museum, Philadelphia. All are attributed to Luristan where many more of the same type were found in the ancient burial grounds. It is remarkable that they are practically identical, at least as regards the hilt, and that the type has not been excavated anywhere else.[1]

The mountainous province of Luristan was in ancient times the home of the Kassites, a warlike hill people who established themselves on the civilized Mesopotamian plain towards the end of the sixteenth century B.C. and ruled in Babylonia until the middle of the twelfth. It is possible that the megalithic tombs from which these iron daggers come were built and used by the Kassites or closely related tribes before the twelfth century, but most of the burials are probably later. The tombs are situated in high valleys on the southwestern slopes of the Zagros mountains, not far from the Iraqi border. They first became known to modern scholars about 1930, when the attractive bronze decorative objects with which they were furnished for the after-life began to appear in Europe and America after passing through the hands of local and international antiquity dealers. Unfortunately, before the tombs could be adequately protected they had been thoroughly plundered by the industrious natives of the neighbourhood, who were quick to exploit the metalwork as soon as they discovered how highly it was valued in the outside world. Conclusions regarding the date and cultural relationships of the people buried in the tombs must be chiefly based on the study of material scattered among numerous museums and private collections, at least until the final results of recent archaeological investigations in the district are published.[2]

Under these unsatisfactory conditions the great majority of the Luristan objects can only be placed roughly between the beginning of the twelfth and the end of the seventh century B.C. A series of bronze weapons from Luristan—short swords or long daggers of a type well known throughout the Near East—are inscribed with the names of Babylonian kings who reigned during the second half of the twelfth century and the beginning of the eleventh.[3] Certain other Luristan weapons may be considerably earlier, but this supposition rests on less satisfactory grounds. Some of the pottery and bronze vessels found in the tombs probably belong to the same period as the series of inscribed daggers, to judge by their marked resemblance to vessels excavated at certain Iranian sites (Tepe Giyan and Tepe Sialk) and dated approximately from the thirteenth to the tenth century B.C. A distinctive class of openwork bronzes, the typical Luriston horse-trappings, ornaments, and charms that have made the region famous, are cast in highly stylized but spirited designs representing fantastic animals and humans. Many of these objects are ultimately related to traditional Mesopotamian themes, such as the hero grappling with two animals, but the style is foreign to the civilized plain. Although nothing exactly like them has been found elsewhere, the bronzes show a broad family resemblance to the work of other hill peoples who lived and roamed on the northern fringes of civilization in the first half of the first millennium B.C. Many of them certainly resemble "neo-Hittite" work, as has often been pointed out, and this suggests that they belong to the first few centuries of the first millennium B.C. A very few perhaps show Scythian or even early Achaemenid connections (to the sixth century B.C.) but the evidence for this is scanty and the influences seem to be mutual. Another class of Luristan bronzes—votive pins, "belt ornaments," and ritual vessels—are decorated with designs in repoussé. Late Assyrian influence is evident in some of these, and they are usually assigned to the seventh century B.C., although one at least has been thought to be as late as the sixth century on comparison with Achaemenid art. Considering the Luristan material as a whole, there is no noticeable evidence of Greek influence, which began to permeate the Near East in the sixth century B.C., and this is an additional indication that the bulk of the Luristan material is not later than the seventh century, while most of it is probably two or three centuries earlier.

Almost all the Luristan objects are bronze. Iron when it does occur is usually in objects which are partly bronze, for example in axes and daggers with bronze haft and iron blade, or in pins with bronze head and iron shaft. Iron was used alone for personal ornaments, particularly bracelets, and this suggests that it was still considered a rare and decorative metal rather than a strictly utilitarian one. The occurrence of iron in combination with bronze and its use for small ornaments would indicate that these objects were made before the Iron Age was in full swing and thus within a century or two of 1000 B.C.

We have mentioned the problem of dating the Luristan bronzes because our iron dagger certainly falls within their general date range: its distinctive type has been repeatedly and exclusively found in association with these bronzes. But a date well before the middle of the first millennium may be suggested for the dagger on more particular grounds as well. The lions and human masks seem at first to have been conceived in an entirely different manner from the fantastic yet life-like forms of the Luristan decorative bronzes. But the alien character of the dagger's decoration may be explained, at least in part, by differences in material and technique, since it was obviously much more difficult to fashion the same exuberant motives in iron than to cast them in bronze, with its fluidity and its centuries-old tradition in the lost-wax process. Like some of the Luristan bronzes the representational elements in our iron dagger may be compared with "neo-Hittite" figures of humans and animals and, perhaps merely on account of the harsh quality of the iron, they especially recall the colossal bearded stone figures supported by lions from Zinjirli and Carchemish.[4]

The human mask associated with lions is familiar in Luristan bronzes. Yet we would venture to compare our dagger with a Hittite monument dated to the thirteenth century B.C., the "dagger-god" of Yazilikaya. This curious relief, carved in the rock sanctuary near the ancient Hittite capital, represents a dagger with an elaborate hilt surmounted by a head wearing the conventional headdress of the Hittite gods. Each side of the hilt's surface is covered by a crouching lion facing the blade, with the head and forepart of another lion projecting outward above the first. The carving seems to celebrate a sacred or divine dagger, which must have played some important part, religious or historical, in the national life of the Hittites and would thus be a familiar symbol to its contemporaries. It has been suggested that the actual dagger represented at Yazilikaya came from the kingdom of Mitanni on the upper Euphrates, perhaps as a trophy of war, after the Hittites had conquered that country in the early fourteenth century B.C., and that its blade was made of serviceable steeled iron, under a process that had been invented very shortly before that time, probably by smiths living within Mitannian territory.[5] It would not be difficult to understand why the Hittites would worship the earliest iron dagger in their possession. Weapons having hilts decorated with lions are known in the third millennium and are quite common during the Iron Age, but with the crouching lions guarding the blade and the divine head above, the "dagger-god" is particularly reminiscent of our own dagger. Although ours was likely made considerably later, it is quite possibly directly connected with the "dagger-god," whose fame doubtless spread over the neighbouring countries. The magical benefits bestowed upon daggers by the image of this god might help to explain why the hilt of an apparently utilitarian weapon was fashioned into such an elaborate design when iron was still a new and difficult material.

All but one of the known iron daggers of the class to which ours belongs are said to have come from Luristan. This single exception is a dagger of identical form, seen by the orientalist E. E. Herzfeld in an antiquities collection in Kiev.[6] It was stated in the catalogue of the collection to have come from Samsun, a Black Sea port of eastern Asia Minor, and was acquired before 1900. Since the modern world did not know Luristan as the source of the bronzes until at least thirty years later, Herzfeld thought that the Kiev specimen might have been actually unearthed at Samsun, "in one of the many tumuli of the region, of Pontus," and that the daggers might have been exported from Asia Minor to Luristan in quantity. This is an attractive theory on account of the tradition, revealed in ancient Greek and Roman texts, that calls Asia Minor the home of the first iron-workers. The suspicion remains, however, that the dagger found at Samsun may have been brought from Luristan in modern times, since a very few objects, then unidentified, had found their way from Luristan to European collections long before 1930 and probably by way of Asia Minor.[7] In any case the Luristan owners of these daggers must have had close connections with the Caspian area and Armenia and with regions still further to the north and west. The distribution of certain other types of weapons is part of the evidence for relations between these northern areas and Luristan.[8]

Since a more definite date for our iron dagger depends on the results of further archaeological investigations in Iran, let us for a moment leave it to swing between the tenth and the seventh century B.C. It need only be reaffirmed that this highly distinctive type of dagger is certainly among the earliest known implements made entirely of iron, and moreover that its complex design, suggesting an advanced iron-working technique, is unique among surviving iron objects of comparable age. Its special interest may be more clearly indicated by the following brief survey of the early history of iron-working.[9]

1200 B.C. is the conventional date for the beginning of the Iron Age. The Bronze Age which preceded it had begun in the Near East about two thousand years earlier and had witnessed the flowering and decline of the world's earliest civilizations, in Mesopotamia, Egypt, and northern India. During the whole of the Bronze Age iron was know in the Near East, although the process by which it could be turned into an effective material for tools and weapons was not discovered until toward the end of that period, and for many centuries it was used chiefly for small amulets, ornaments, and ceremonial objects. The first iron to be worked was meteoric, as can be determined by examining the nickel content of early specimens. Small tubular beads of meteoric iron dated to the Predynastic period (before 3000 B.C.) have been found in Egypt and small Bronze-Age implements of this metal have been found both in Egypt and in Mesopotamia. The earliest known objects of terrestrial iron, produced by smelting iron ores, have been found in Mesopotamia; these belong to the early third millennium B.C. and include the remains of an iron dagger-blade in a bronze hilt. The knowledge of primitive iron smelting seems to have spread gradually through the Near East, for small ornamental or amuletic iron objects dated to the second millennium B.C. have frequently been found in Egypt and Syria as well as in Mesopotamia. After 1500 B.C. both excavated objects and written records testify to their rapid increase. During the Bronze Age iron was often decorated with gold, and was itself used occasionally to decorate objects of other materials, as for example in a dagger from Nuzi with bronze blade and iron hilt (about 1500 B.C.).

The earilest terrestrial iron was undoubtedly considered a precious metal and may have been discovered as a by-product of refining gold in crucibles, from certain gold ores rich in iron. Cast iron was almost certainly unknown in the ancient Near East, at least until Roman times. When iron first became an independent industry it must have been produced in the form of a "bloom," a tough, spongy mass obtained directly from the ore by heating the latter until a fluid slag separated from it. The bloom had to be transformed into a solid, compact substance by hammering out the non-metallic impurities at a high temperature. It could then be forged into the required shape. But until the complicated process of "steeling" the iron was invented, i.e. heating it in the presence of carbon (carburizing) and suddenly cooling it (quenching), iron remained less effective than bronze for making tools and weapons. This revolutionary discovery was probably made about 1400 B.C. somewhere in the iron-rich hill country south of the Caucasus mountains, between the Black Sea and the southern end of the Caspian.

There is evidence that Mitanni was the first country to produce effective iron weapons. In its heyday (the fifteenth and early fourteenth century B.C.) Mitanni probably controlled much of the iron-mining country to its north and east. The Egyptian royal archives state that among the presents sent by the Mitannian king Tushratta to Amenophis III and Amenophis IV (Akhenaten) were a number of iron ornamental objects and three daggers with iron blade (early 14th century B.C.) The fine iron-bladed dagger found in the tomb of Tutankhamun, who reigned almost immediately after these kings, probably came from the same region, if indeed it is not one of the daggers mentioned. A beautiful axe with an iron blade and bronze haft decorated with a boar and lion's heads inlaid with silver was found at Ras Shamra in North Syria. It is dated to the end of the fifteenth century by its excavator, who considers it Mitannian work and stylistically related to the Yazilikaya "dagger-god."[10] In any case, whether they already knew how to forge iron weapons or learnt the art from Mitannian smiths, the Hittites probably held a monopoly of practical iron-working for almost two hundred years after their conquest of Mitanni in the first half of the fourteenth century B.C. But few iron objects dated before 1200 B.C. have been found in Asia Minor, and the iron swords and other iron objects mentioned in Hittite texts are listed as items of special importance. Apparently the knowledge of steeling iron was still confined to a few skilled smiths, perhaps as a closely guarded secret. A letter from the Hittite king Hattusilis III (early thirteenth century B.C.) to an unknown person, probably the king of Assyria, proves that iron was being mined and smelted in quantity within the Hittite empire.

When the Hittite empire fell about 1200 B.C. before the invading hordes from Europe and thousands of refugees fled into Syria, the knowledge of advanced iron-working spread rapidly through the Near East and then throughout the world. Probably within a century or two it came to Europe and India, and considerably later to China and Africa. The sudden appearance of iron in Palestine with the arrival of the Philistines in the twelfth century B.C. is an example of the manner in which the iron industry may have been brought to the whole of the Near East by the dispersion of smiths from the country formerly ruled by the Hittites. The Philistines came to Palestine as displaced persons after the fall of the Hittite empire. In their new home they seem to have still tried to maintain a monopoly of iron-working (I Sam. 13:19–22), although their iron had to be imported. By the ninth century B.C. iron tools and weapons had become general in Palestine as well as in Mesopotamia and Syria.

Iron is often mentioned in Assyrian texts. The many references to iron and iron objects received as tribute show that the Assyrians obtained their iron from the mountainous countries to the north. A hoard of iron tools and weapons and unworked iron was found in the palace of Sargon II (721–705 B.C.). Iron tools and weapons, however, increased but slowly for common use, and it was not until the Roman period that they entirely superseded those of bronze.

We have seen that during the Bronze Age iron was considered a precious and ornamental metal. By the ninth century B.C. the discovery of the process of carburizing had turned it into a fairly common material for manufacturing tools and weapons, but technical methods had not been evolved for the creation of intricate shapes and surface decoration in this metal, in spite of the fact that it was still considered suitable for personal adornment. Bronze continued to be used for casting decorative objects, and with increasing virtuosity as its utilitarian value declined in competition with the newer metal. Iron shapes remained simple and iron surfaces plain, except when decorated with the more tractable bronze. Among pre-Roman iron objects from the Near East our dagger and its identical companion pieces from Luristan are therefore conspicuous.[11]

Even if only one of these daggers had been known to exist, the appearance of the heads and lions—their complexity and smoothness—would immediately suggest that they had been shaped in a mould. That this was actually done is further indicated by comparison of the specimens that have been published, for they are all remarkably alike. Their dimensions seem to be the same, although their varying states of preservation and the lack of unambiguous measurements makes proof impossible without further investigation. But it has been stated that several hundreds of these weapons have been found in Luristan tombs, usually in a very poor state of preservation,[12] and it is difficult to imagine how objects manufactured in such quantity could have been produced so elaborately by free-hand forging and chiselling. On the other hand, there is no evidence for cast iron until much later, even in China, where the process is believed to have been invented towards the end of the first millennium B.C. Our dagger was recently submitted to microscopic analysis, first to determine the method by which these elements had been shaped and then to determine whether the blade had been steeled effectively.[13] Three samples from the dagger were examined: (1) from the edge of the pommel's disk, (2) from the tip of one of the beards, and (3) from the tip of the blade.

As was to be expected the first sample showed that the dagger was made of iron forged from a bloom by primitive methods, and having a medium carbon content.[14]

Concerning the sample from the tip of the blade the report states that the structure resembles that of a modern razor blade. But it has an average Vickers hardness number of only 190, and so had not been quenched and drawn to give it the properties generally associated with a Damascene blade, which it resembles structurally. We think that this apparent discrepancy in technique may be explained by the fact that methods of steeling iron were still experimental and improperly understood when our dagger was made. Analysis of a series of iron objects from Egypt dating between 1200 B.C. and Roman times indicated that at first carburization only took place. Then from about 900 to 700 quenching began, and tempering was only introduced by the Romans.[15] The blade of our dagger would not have been hard enough to be an effective slashing weapon. It would quickly lose its edge. But slashing swords were still uncommon in the Near East when it was made and it is well designed for a stabbing weapon. Moreover, ornamental whetstones found in the Luristan tombs prove that the owners of such weapons were prepared to sharpen them.

The sample from the beard suggested that the upper decorative elements were forged in one piece with the rest of the dagger, so that before the final shaping a piece of steel having a T-shaped cross-section projected from the pommel. Then "either by forcing the T-section into a die or hammering it with a countersunk punch engraved with the features of the face, the arms of the T were bent backwards." This is inferred from variations in carbon content, since the outer parts of the objects would become decarburized during the shaping, and from the direction of the streaks of impurities, which would run at right-angles to the hammer blows. The crouching lions were probably formed by the same method.

The technique of producing plastic decoration by means of hammering iron into a punch or die (swaging) is not known elsewhere until much later, and was probably not invented until Roman times.[16] How these complex and stereotyped iron daggers from Luristan came to be produced in such quantity by this technique and why the technique was not continued are intriguing questions. Perhaps the objects were made in an attempt to develop a decorative technique for iron comparable to bronze-casting before the proper limitations of the material were appreciated and before its new utilitarian character destroyed its prestige as an ornamental material. It is also possible that religious beliefs played a part in forcing old symbols of power on the metal which had so recently acquired a new and mysterious efficacy. This efficacy must still have seemed magical since it was scarcely understood even by the smiths themselves, and on account of imperfect knowledge of the complicated processes of steeling was still unpredictable.

MARGARET SPENCE
WINIFRED NEEDLER

NOTES

1. For mention of this type of dagger see: Herzfeld, *Iran in the Ancient East* (1941) 135; Godard, in *Ars Asiatica* 17 (1931) 40–41; Godard, in *Athar-é Iran* 3 (1938) 247; Legrain, *Luristan Bronzes in the University Museum* (*Mus. J. Suppl.*, 1934) 16; Dussaud, in *Surv. Pers. Art* I (1938) 268

(probably iron although illustrated with bronze weapons). Godard, who explored the plundered burial grounds of Luristan for the Iranian government, states that large numbers of this type of iron weapon were found, generally in a badly decomposed condition (see both works cited).

2. Recent summaries of the various arguments for dating the Luristan material are given in the following: Contenau, *Man d'Arch. Or.* IV (1947) 2160–2176; Eilers, in *Handbook Nicholson Mus.* (1948) 107–113; Hanfmann, in *A.J.A.* 56 (1952) 31–33; Frankfort, *Art and Arch. Anc. Or.* (Penguin Books, 1954) 207–213. Publication of the final report of the Holmes Luristan Expedition led by Erich Schmidt is expected to produce fresh evidence.
3. The Royal Ontario Museum possesses the earliest known example in this series, the sword of Marduk-shapik-zeri, published by Professor T. J. Meek, in *B.A.S.O.R.* 74 (1939) 7 ff., as well as a representative collection of Luristan bronzes.
4. Bossert, *Altanatolien*, nos. 830, 901–904.
5. The Yazilikaya dagger-god's possible relationship to Mitanni and to the beginnings of effective iron weapons has been discussed by Schaeffer (*Ugaritica* I, 1939, 120–125). See also Forbes *Metallurgy of the Ancient World*, 452.
6. Herzfeld, op. cit., 135.
7. Dussaud, op. cit., 254.
8. Maxwell-Hyslop, in *Iraq* 8 (1946) 44–51.
9. For a convenient summary of the early history of iron-working see Forbes, op. cit., Chaps. 2 & 11.
10. See Note 5 above.
11. Some iron bracelets from Luristan are probably contemporary with the dagger and are perhaps similar to them technically. See Herzfeld, op. cit., 135, fig. 271.
12. Godard, in *Ars Asiatica* 17 (1931) 40–41, and in *Athar-é Iran* 3 (1938) 247.
13. The analyses were made by the Ontario Research Foundation, through the generosity of Dr. O. W. Ellis, Director of the Dept. of Engineering and Metallurgy.
14. Herzfeld (loc. cit.) and Godard, (*Athar-é Iran* 3, 1938, 247–250) speak of analyses made on two specimens of the same type of dagger. Both deal only with the question whether the weapons were forged or cast and the results agree with the present analysis.
15. Forbes, op. cit., 411.
16. Przeworski, *Metallindustrie Anatoliens*, 160.

PUBLICATIONS AND PHOTOGRAPHS

Publications of the Royal Ontario Museum of Archaeology may be ordered at the Sales Desk, and prints of photographs of Museum objects from the Main Office of Archaeology. Orders by post should be sent to the Secretary of the Museum.

The following publications of the Royal Ontario Museum of Archaeology are in print, and may be obtained from the Museum:

Fibres, Spindles and Spinning Wheels, by Dorothy K. Macdonald (mimeographed, 1944), price 50 cents.

Outline Guide to the East Asiatic Section (1950), price 15 cents.

Chinese Court Costumes, by Helen E. Fernald (1946), price $1.10.

Outline Guide to the Royal Ontario Museum (1951, Section III deals with the Museum of Archaeology), price 50 cents.

Excavating Ontario History, by Margaret M. Thomson (published by the Division of Education, 1947), price 15 cents.

Palestine, Ancient and Modern, a Guide to the Palestinian Collection (1949), price $1.50 (by post $2.00).

Picture Books: *Chinese Pottery Figurines; Egyptian Mummies; Black-figure and Red-figure Greek Pottery* (all 1950), 50 cents each.

Books of the Middle Ages (1950), price 35 cents.

Greek Coins in the Royal Ontario Museum of Archaeology (mimeographed, 1951), price 10 cents.

Suggestions for Excavating Indian Sites (mimeographed, 1951), price 10 cents.

The Chair in China, by Louise Hawley Stone (1952), price $2.00.

Chinese Frescoes from the Royal Ontario Museum (Museum *Bulletins* Nos. 12, 13 and 14, bound together), price 75 cents.

Bulletin of the Royal Ontario Museum of Archaeology, price 60 cents (special numbers 19, 20, and 21, 75 cents).

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